

**COMMONWEALTH OF MASSACHUSETTS
OFFICE OF CONSUMER AFFAIRS & BUSINESS REGULATION
DIVISION OF ENERGY RESOURCES**

RENEWABLE ENERGY PORTFOLIO STANDARD

NOTICE OF INQUIRY

**Regarding Some Proposed Revisions of the Regulations
Pertaining to the Definition of “Low-Emission, Advanced Biomass
Power Conversion Technologies”**

July 1, 2005

The Massachusetts Division of Energy Resources (DOER) and the Department of Environmental Protection (DEP) hereby announce the initiation of an Inquiry regarding proposed revisions of the Renewable Energy Portfolio Standard (RPS) regulations.¹ While DOER is responsible for promulgating and administering the RPS regulations, some of the issues addressed in this Notice are in the purview of the DEP. Hence, this Notice is issued jointly.

The primary focus of the Inquiry is the definition of “low-emission, advanced biomass power conversion technologies” and certain related matters, as detailed below. This Notice presents a preliminary proposal for stakeholder discussion.

The goal of the Inquiry, and any proposed regulatory changes that may follow, is to provide a clarification of the definition so that it:

- Is consistent with the language and intentions of the RPS statute.
- Provides those who may want to finance a facility retrofit project or new plant project with sufficient certainty as to whether the project will qualify as a “new renewable generation unit” and, thereby, reduces the potential risk to those who would develop or provide financing for such projects.
- Balances the need to allow for the retrofit of existing thermal power plants with “low-emission, advanced biomass power conversion technologies,” and the need to maintain the RPS statute’s preference for developing new generation utilizing all eligible renewable energy technologies.
- Improves the likelihood that new renewable generation development will keep pace with the accelerating compliance levels of the RPS and will, thereby, steadily increase the development of a cleaner, more diverse, and more sustainable electrical energy supply for the Commonwealth.

The agencies will conduct this Inquiry for a period of approximately one month, beginning with the date of this Notice (as specified in the Timetable on page 17), although they reserve the right to extend the period. After considering the comments received during this Inquiry, DOER

¹ The RPS regulations were promulgated in April of 2002 as 225 CMR 14.00 et seq. Hereafter, all references to sections of the RPS regulations will omit “225 CMR.” The regulations can be accessed at <http://www.mass.gov/doer/rps/regs.htm>.

intends to issue proposed revisions of the RPS regulations in a formal rulemaking. DEP may revise the air quality regulations to complement the DOER changes.

It is important to note that the outcome of this two-part process will not invalidate any Statement of Qualification or Advisory Ruling issued by DOER prior to the publication of this Notice.² Subject to footnote 2 below, DOER does not intend to issue any Statements of Qualification or Advisory Rulings with respect to biomass projects prior to promulgation of regulations resulting from the rulemaking anticipated to follow this Inquiry.³

This Notice includes the following parts:

- Background: historical narrative and discussion of the primary focus.
- Issues: brief discussion of several critical issues pertaining to that focus.
- Summary of Preliminary Proposal for Regulatory Revisions: brief descriptions of potential modifications to the RPS qualification of low-emissions, advanced biomass power conversion technologies and the generation units that would utilize them.
- Questions: questions meant to elicit information, perspectives, and opinions from stakeholders, which will inform DOER's and DEP's drafting of the final proposed regulatory revisions for formal rulemaking.
- Procedure and Schedule: how DOER and DEP will conduct this Inquiry.

Background

The statutory language for RPS⁴ provides a list of “renewable energy generating sources” and then specifies which of those qualify as “new.” Among the sources that can qualify as “new” are those that use “low-emission, advanced biomass power conversion technologies, such as gasification using such biomass fuels as wood, agricultural, or food wastes, energy crops, biogas, biodiesel, or organic refuse-derived fuel.” DOER, in its RPS regulations, refined the list of Eligible Biomass Fuels,⁵ elaborated on what was meant by “advanced biomass power conversion technologies,”⁶ and provided detail on how the “low-emissions” criterion was to be satisfied.⁷

The language of the statute is not specific with regard to what would constitute “advanced biomass power conversion technologies” except for giving “gasification” as an

² As the date of issuance of the NOI, there are four Statement of Qualification Applications pending before DOER: Boralex Fort Fairfield (ME, 33 MW), Boralex Livermore Falls (Maine, 40 MW), Boralex Stratton Energy (Maine, 50 MW), and Greenville Steam Company (Maine, 20 MW). DOER reserves the right to issue or deny Statements of Qualification for these projects pursuant to the existing regulations.

³ Advisory Rulings issued prior to the date of publication of this Notice shall remain valid only with respect to those aspects of each Ruling that reference specific fuels, technologies, and emission limits. Advisory Rulings pending but not yet issued as of the date of publication of this Notice will not be issued until promulgation of regulations resulting from the anticipated follow-up rulemaking.

⁴ See M.G.L Chapter 25A, Section 11F, accessible at <http://www.mass.gov/legis/laws/mgl/25a-11f.htm>.

⁵ See the definition of this term at 14.02.

⁶ See 14.05(1)(a)6.

⁷ See 14.05(1)(a)6 a, b, and c.

example. DOER has interpreted this statutory language as intending to force improvements in what is one of humankind's oldest technologies for obtaining energy and, although less polluting than some fossil fuel technologies, is arguably more polluting than other renewable technologies.⁸ The regulations omit mention of gasification, so as not to suggest that it is uniquely favored. On the other hand, the regulations categorically exclude from eligibility "pile burn, stoker combustion or similar technologies," on the recommendation of the Legislature's Joint Committee on Energy, due to a perception that they are old technologies and not "advanced."⁹

Except for the categorical exclusion of pile burn and stoker combustion, the current regulations do not specify eligible technologies. For that reason, DOER also included in the regulations a provision for requesting "an advisory ruling from the Division to determine whether a Generation Unit would qualify as a New Renewable Generation Unit."¹⁰ Advisory Rulings are intended to reduce the uncertainty that otherwise can exist in an undertaking to construct a new biomass plant or to retrofit an older plant. As intended, reduction of uncertainty apparently has been useful to power plant owners and developers in obtaining financing for projects. During the three years since promulgation of the regulations, DOER has responded to sixteen requests for Advisory Rulings, all but one of them for biomass plants.¹¹ Of those sixteen, the development of the first and largest (the 50 MW replacement of a coal-fired steam boiler with a biomass, fluidized bed boiler at Schiller Station in Portsmouth, NH) is well along, with completion of construction expected late in 2006. Others are at various stages of planning, siting, permitting, or financing.

A disadvantage of the Advisory Ruling process is that it has come to be perceived as a necessary preliminary to project development, even when a proposed project is substantially the same as a project for which a previous Advisory Ruling has been issued, apparently as a prerequisite for obtaining financing. Thus, the process of a developer requesting an Advisory Ruling, and DOER responding to the request, has become an additional step, with its attendant cost and burden for both parties.

On the other hand, the process of issuing Advisory Rulings has proven useful to DOER. DOER staff have become more aware and more conversant with the details of the various options for power plant construction and retrofit. Both Wellons close-coupled gasification and modern fluidized bed technologies have been found by DOER to be advanced biomass power conversion technologies for RPS purposes. However, DOER also has become aware that a plant owner sometimes can improve the combustion efficiency of older biomass plants with stoker combustion through retrofitting the under grate and over fire air equipment and balance.¹² In addition, an owner can decrease the emission of nitrogen oxides (NO_x) from such older plants

⁸ However, in the view of DOER, sustainable biomass shares with other renewable resources a zero net emission of carbon dioxide, the most significant of the greenhouse gases.

⁹ 3/6/02 letter to DOER, "Report of Joint Committee on Energy Regarding Final Proposed Regulation . . ." accessible as <http://www.mass.gov/doer/rps/report.htm>.

¹⁰ See 14.06(5).

¹¹ Further information on Advisory Rulings and links to all of them are at <http://www.mass.gov/doer/rps/advisory.htm>. Note that four requests from GenPower were consolidated into two Advisory Rulings.

¹² See the Advisory Ruling for Hemphill Power & Light via <http://www.mass.gov/doer/rps/advisory.htm>.

below current Massachusetts standards for new plants through the addition of certain new emission control technologies, what one supplier calls Regenerative Selective Catalytic Reduction (R-SCR).¹³ (This new type of emission control technology is discussed below.)

DOER has learned that the type of gasification technology that the Legislature may have contemplated when it cited gasification as “advanced” in 1997, namely that of the Vermont Gasification Project, a pilot project attached to the McNeil wood-fired power plant in Burlington, VT, has not yet proven practicable.¹⁴ In addition, during the past two years, DOER has found that the terms “pile burn”, “stoker combustion”, “gasification”, and “close-coupled gasification” require clarification, since each apparently encompasses a range of technologies and a continuum of system design and control strategies. None of the three technologies that have been characterized as “gasification” in requests for advisory rulings approaches the apparent 1997 ideal of a gas clean enough to run a gas combustion turbine (which was the unattained goal of the Vermont Gasification Project), as contrasted with a boiler/steam turbine or a diesel generator.¹⁵

A closely related issue that also has created uncertainty, only partially relieved by the Advisory Ruling process, is the understanding of “low-emission.” Although the final regulations reflect the Joint Committee’s recommendation that non-Massachusetts biomass plants meet air emission standards “consistent with the standard for emissions of a comparable biomass unit in the Commonwealth,”¹⁶ there have been *no* plants recently permitted in Massachusetts that are comparable to new or retrofitted plants proposed for MA RPS credits elsewhere.¹⁷ For each such proposed project, DOER, in consultation with DEP, determines the standards that are likely to be acceptable in Massachusetts were such a plant to be permitted here, but without the benefit of the extensive BACT (Best Available Control Technology) review that plants undergo in Massachusetts.¹⁸ This has been particularly difficult in the case of Advisory Rulings for the proposed retooling of older out-of-state plants, which would (pursuant to the RPS regulations and guidelines) need to meet today’s standards for new plants. It is even more difficult for plants

¹³ Thus far, DOER is aware of two companies offering this type of NOx reduction technology: Babcock Power Environmental, Inc. (Worcester, MA) and BD Heat Recovery Division, Inc. (Seminole, FL).

¹⁴ See a description at <http://www.nrel.gov/docs/fy00osti/27983.pdf>. However, the gasification project under development by the Biomass Energy Resource Center at Heyes Forest Products in Orange, MA, is a pilot for a technology from India that may meet that gasification ideal, although the current plan is to co-fire the gas with diesel in a diesel generator set. Another pending gasification project would use Finnish gasification technology in a 320 kW (gross) (280 kW net) demonstration project at Tallon Lumber in North Canaan, CT (financed by the CT Clean Energy Fund, <http://www.ctcleanenergy.com/index.html>). This project also would co-fire the product gas with up to 20% diesel in a modified engine. Information on the latter is from an oral presentation by Keith Frame of the CEEF at the Building Energy 2005 conference in Boston, 3/17/05. DOER has not received a formal inquiry regarding the MA RPS qualification of the Tallon Lumber project.

¹⁵ See the Advisory Rulings for Barnstead Power & Light, Hemphill Power & Light, and the Biomass Energy Resource Center project at Heyes Forest Products – via <http://www.mass.gov/doer/rps/advisory.htm>.

¹⁶ See footnote 9. Although the Committee did not provide a reason, DOER thinks they would concur that our in-state plants should compete with out-of-state plants on as level a regulatory playing field as possible and that we should not obtain our “greener” electricity by exporting air pollution to our neighbors.

¹⁷ Ware Co-Gen is the only biomass plant for which a permit has been granted by the DEP since 1997. While its Wellons gasification technology is similar to that of the Barnstead Power and Light plant in New Hampshire (a proposed retooling project that also would use Wellons technology), the latter would use a different fuel (C&D-derived wood), making them not quite comparable. See footnote 15 for a link to the Barnstead Advisory Ruling.

¹⁸ Under 310 CMR 7.02(8)(a)2.

that intend to utilize wood from construction and demolition (C&D) waste, for which Massachusetts is still developing standards and has not yet issued any permits.

Finally, DOER notes that the RPS regulations of Massachusetts, Connecticut, and Rhode Island (the last due to start in 2007) use different criteria for biomass plant qualifications (see below at Issue 4). Most notably, Connecticut's RPS does not have a technology standard, and its emissions standard is an absolute limit of 0.075 lbs per mmBtu for NO_x. The Massachusetts statute includes both a non-specific "advanced technology" standard and a non-specific "low-emissions" standard. Thus, some biomass plants may qualify for one RPS and not the other, which makes it difficult to assess the impact of the Connecticut standard on the Massachusetts market for RECs. The two state RPS programs compete for some but not all of the RECs from biomass plants. These differences also complicate the planning process for the owners and operators of existing biomass plants, as well as the potential developers of new biomass plants, with regard to their technology investment choices. Another consequence of the differences is that, as noted above, a new type of NO_x emission reduction technology has entered the marketplace to retrofit existing biomass plants so that they can meet the lower Connecticut standard.¹⁹ This new technology is also discussed below at Issue 4.

DOER's experience has led to the conclusion that the time has come to revisit DOER's understanding of what should be meant by "low-emission, advanced biomass power conversion technologies," including the current regulatory exclusion of "pile burn, stoker combustion or similar technologies." This Inquiry will include some aspects of the regulations and guidelines that relate to that understanding, most notably (1) the eligibility and Vintage Waiver applicability of previously ineligible plants that are retooled to use eligible biomass fuel with low-emission, advanced biomass power conversion technologies; (2) the eligibility of blended or composite fuels; and (3) time limits on the validity of Advisory Rulings and Statements of Qualification.

Issues

New Plants vs. Retooling Existing Plants, and the RPS Market

From a technical point of view, a completely new biomass plant presents the greatest potential for the installation of more advanced biomass power conversion technologies, which ideally operate with higher energy conversion efficiencies, have lower uncontrolled air emissions, and to which can be added the most effective pollution control equipment. Such plants could create new jobs and increase the renewable share of the region's electricity portfolio with, presumably, acceptable emissions and, in the view of DOER, no net increase in carbon dioxide (CO₂) production. DOER believes that the Legislature intended to encourage the development of cleaner, more advanced biomass power conversion technologies in crafting the language of the statute, and may have intended to favor the construction of new biomass plants over the retrofit of existing plants. However, the statute gives DOER the authority to qualify "any previously operational biomass facility retrofitted with advanced conversion technologies"²⁰ as a New Renewable Generation Unit.

It turns out that the region also has a number of existing plants that have the potential to be retrofitted with advanced biomass power conversion technologies and with better emission

¹⁹ See footnote 13.

²⁰ See M.G.L. Ch. 25A, § 11F, paragraph (b), second sentence.

controls at considerably lower cost than the construction of new plants. In addition, the qualification of such plants for the RPS certificates ("RECs") market may keep them in operation after the expiration of PURPA contracts and, thereby, prevent reduced production of electricity from biomass (and attendant direct and indirect job losses).

In April of 2004, DOER issued a "Guideline on the MA RPS Eligibility of Generation Units That Re-tool with Low Emission, Advanced Biomass Power Conversion Technologies"²¹ (hereafter "Advanced Biomass Retooling Guideline"). In that document, DOER stated that, based on its understanding of the RPS statute and regulations, a previously ineligible older plant that does such a retooling after 1997 can qualify as a New Renewable Generation Unit without recourse to a Vintage Waiver.

If DOER were to set standards for advanced biomass power conversion technology that led to a significant expansion in RPS-qualified biomass power plant capacity, the the supply of MA RECs in the market would increase. If supply were to move substantially ahead of demand, then the price of MA RECs would likely decline significantly. An expectation of such oversupply and price decline would likely deter the investment of capital in new plant construction, both for biomass plants and for generation based on all other renewable resources (wind, solar, landfill methane, anaerobic digestion, etc.). Such a consequence would be counterproductive to the goals of new renewable generation expansion and increased fuel diversity.

This issue pertains in particular to the extent to which any changes in the regulations may or should limit the RPS eligibility of existing (but technologically ineligible) biomass plants that are retrofitted after 1997 to meet the "low-emission, advanced biomass power conversion technology" qualifications (as noted above). Therefore, in drafting changes in the RPS regulations, DOER will carefully weigh the likelihood of impacts on the REC market and on the market for new renewable plant development.

Air Emissions from Biomass Power Plants

Wind and solar photovoltaic are zero-emission energy resources. Anaerobic digester and landfill methane gas plants can have emissions of criteria pollutants comparable to those of natural gas plants but, unlike natural gas, have emissions of CO₂ that have lower greenhouse gas effect than the methane would have had were it emitted instead of combusted. The combustion of biomass (especially solid and liquid forms), on the other hand, produces emissions of "criteria pollutants" that are of serious concern to air regulators.²² The regulations hold biomass plants to

²¹ See <http://www.mass.gov/doer/rps/advbio.htm>.

²² The federal EPA is required to establish national ambient air quality standards to protect public health. Those standards are established for nitrogen dioxide (NO₂) and other nitrogen oxides (NO_x), sulfur dioxide (SO₂), particulate matter (PM), carbon monoxide (CO), ozone, lead, and volatile organic compounds (VOCs). These pollutants have been shown to cause ground level ozone (smog), acid precipitation, regional haze, and other hazards to human health and the environment. If states are shown to be violating these standards, they must establish programs to reduce emissions and bring areas into compliance with the public health standards. Massachusetts is in non-attainment for ozone at this time and has programs and standards designed to bring the state into compliance.

air “emission rates consistent with emission rates for comparable biomass units as prescribed by the Massachusetts [DEP].”²³

DOER seeks to balance (1) the need for the rapid development of new renewable energy resources over the next several years (by providing appropriate conditions for biomass plant development and retrofit), with (2) the need to ensure improvements in the Commonwealth’s environment and economy (by requiring, as a condition for RPS qualification, Massachusetts air emission standards for plants in all jurisdictions), and with (3) the need to avoid undercutting or delaying incentives for the development of such cleaner renewable resources as wind and solar.

Varying State RPS Standards for Biomass Power Plants and Technologies for Meeting Them

A complicating factor in New England is the use of different qualification standards in the current Connecticut RPS and in the pending Rhode Island RPS.²⁴ Due to their relative shares of the market, the Connecticut biomass standards are of more significance. Most notably, Connecticut has no technology standard, using only an emissions standard established by statute at 0.075 pounds per mmBtu for NO_x. Massachusetts, by contrast, has two standards established by statute: both a non-specific “advanced biomass power conversion technology” standard and a non-specific “low-emissions” standard. The Massachusetts RPS regulations, as a matter of equity, extend the low-emissions standard (but only as a condition of RPS qualification) to plants both in and outside of Massachusetts and apply the standard to all air pollutants that a comparable biomass plant in Massachusetts would have to control.

The difference between the Massachusetts and Connecticut biomass qualification standards is important for three reasons. The first is that some biomass plants may qualify for one RPS and not the other, which makes it difficult to assess the impact of the Connecticut standard on the Massachusetts market for RECs. The two state RPSs compete for some but not all of the RECs from biomass plants. The second, closely related to the first, is that these differences complicate the planning process for the owners and operators of existing biomass plants, as well as the potential developers of new biomass plants, with regard to their technology investment choices.

The third reason is that a new type of NO_x emission reduction technology has entered the marketplace to retrofit existing biomass plants so that they can meet the Connecticut standard.²⁵ This technology is installed at the “back end” of a system, after other emission control technologies have already reduced NO_x and other criteria pollutant emission levels. It provides a significant, additional reduction in NO_x emissions to a level below the Connecticut standard of 0.075 lb/mmBtu, which is, in turn, below the standard that heretofore has been required of, or

²³ The RPS regulations at 14.05(1)(a)6.a and b. This provision was recommended by the Joint Committee out of a stated concern that air permits in some jurisdictions may be less stringent than those required for new biomass plants in Massachusetts plants. See footnote 9.

²⁴ Summary descriptions of those standards are at the Database of State Incentives for Renewable Energy: <http://www.dsireusa.org/library/includes/type.cfm?Type=RPS&Back=regtab&CurrentPageID=7&Search=TableType>. Note that the Connecticut RPS was effective as of 2004, while the Rhode Island RPS (officially termed a Renewable Energy Standard, RES) will begin in 2007. Both initially place significantly smaller demands on the RPS certificates market than does the MA RPS, but Connecticut’s percentage standard accelerates in 2007, and its demand will nearly equal the Massachusetts demand in 2008. For additional information, see pages 10 and 21 of the *Annual RPS Compliance Report for 2003* via <http://www.mass.gov/doer/rps/annual.htm>.

²⁵ See footnote 13.

proposed for, MA RPS eligible biomass plants. DOER has been asked to consider whether installation of the new NO_x reduction technology would qualify an existing, ineligible biomass plant as utilizing a low-emission, advanced biomass power conversion technology and, thereby, as a New Renewable Generation Unit whose entire output would generate MA RPS RECs. The argument is that such technology should itself qualify as “advanced biomass power conversion technology.”

However, DOER has interpreted the 2002 letter from the Joint Committee on Energy²⁶ to mean that an emissions standard alone cannot suffice to meet the statute’s technology as well as its emission standard, and believes that a biomass unit must be evaluated by both an emissions standard and a technology standard. Therefore, under this interpretation of the statute, the new NO_x reduction technology discussed above cannot, by itself, be regarded by DOER as an “advanced biomass power conversion technology.”²⁷

Construction and Demolition Materials and Other Derived Biomass Fuels

The wood derived from C&D waste is a “fuel of opportunity” for use in biomass power plants. C&D waste must be disposed of somehow, and the long-practiced disposal of C&D in landfills in Massachusetts is expected to be banned in the near future. Consequently, C&D waste-derived wood can be obtained at significantly lower cost than other forms of solid biomass fuel. Its use as a fuel, although neither its only possible re-use nor necessarily its most valuable re-use, is consistent with goals of the Massachusetts *Beyond 2000 Solid Waste Master Plan*.²⁸ On the other hand, C&D wood may include contaminants such as lead, arsenic, and other heavy metals. This may raise the cost and complexity of biomass projects. In the interest of interagency regulatory consistency, DOER proposes to revise the definition of Eligible Biomass Fuel in the RPS regulations to include C&D wood as defined in the relevant regulations of the DEP. Heretofore, the RPS qualification of C&D wood has been based on its Response to Public Comments in the original RPS rulemaking process, which referenced a letter from the DEP to DOER.²⁹ The use of C&D wood in an RPS-qualified plant outside of Massachusetts will be conditioned on air emission standards that are as stringent as would be the case for a comparable plant permitted within Massachusetts.

Summary of Proposed Revisions

1. Definitions (225 CMR 14.02)

Eligible Biomass Fuel would be revised to be explicit regarding the eligibility of “C&D wood” and to define that term in the same manner as the DEP, as is then in effect.

2. Eligibility criteria for “low-emission, advanced biomass power conversion technologies”

DOER proposes to change the criteria at 225 CMR 14.05(1)(a)6 as follows:

²⁶ See footnote 9.

²⁷ DOER and DEP also note that a NO_x reduction technology by itself does not address any air emissions besides NO_x and, therefore, would not satisfy the low-emissions criterion of the Massachusetts RPS statute and regulations.

²⁸ Links to the Plan and its updates are at <http://www.mass.gov/dep/bwp/dswm/dswmpubs.htm>.

²⁹ Both DOER’s February 6, 2002 “Summary of Public Comments and Agency Responses” (see item 1.E on page six) and the DEP’s January 8, 2002 letter, to which said item 1.E makes reference, can be accessed on line at <http://www.state.ma.us/doer/rps/delproc.htm>.

(a) DOER proposes to *delete* the categorical exclusion of pile-burn and stoker combustion technologies, at least some of which appear to merit the “advanced” designation, as discussed in the Background and Issues sections of this Notice. Thus, DOER intends to not categorically exclude any type of technology, provided that its use for a particular proposed project meets the “advanced” and “low-emission” criteria described below.

(b) “Advanced biomass power conversion technologies” (for post-1997 Units, retrofitted pre-1998 Units, and Vintage Units) would be evaluated by an objective, technical, performance standard, namely “Net Heat Rate,” which is the ratio of the “higher heating value” (HHV) of the input fuel to the quantity of the net electrical power output of a Generation Unit, after deducting “parasitic load.” The ratio is expressed as Btu/kWh. A Unit with a lower Net Heat Rate is deemed more efficient because it requires less fuel to produce the same amount of power (or produces more power from the same amount of fuel) than a less efficient unit with a higher Net Heat Rate.

The proposed Heat Rate standards are provided below in Table 1. Based on DOER’s familiarity with the biomass power plant industry, including information from actual plants, we believe that these represent Net Heat Rates that are actually achievable with optimal use of currently available technology. However, DOER would like to learn by means of this Inquiry about the heat rates of existing, high-efficiency plants not yet known to DOER, as well as about power plant technologies on the verge of commercial availability or under development. The reason for specifying different limits for fluidized bed and non-fluidized bed units is that, while the more expensive fluidized bed units are more effective and appropriate for fuels that are heterogeneous in type, size, and moisture content, they are also inherently less efficient, due to the heavier parasitic load of fans.³⁰ DOER will provide in the RPS Guidelines the protocols for calculating or determining Net Heat Rate. Those protocols will be developed concurrently with this Inquiry and the subsequent Rulemaking.

Table 1

New or Retooled Biomass Steam Electric Generation Units
Net Heat Rate Limits for Advanced Biomass Power Conversion Technologies

	Equal to or greater than 25 MW	Equal to or greater than 10 MW and less than 25 MW	Equal to or greater than 1 MW and less than 10 MW
Fluidized Bed	14,500 Btu/kWh	16,000 Btu/kWh	19,000 Btu/kWh
Non-Fluidized Bed	12,300 Btu/kWh	13,000 Btu/kWh	15,600 Btu/kWh

³⁰ Non-fluidized bed units are expected to include, but not be limited to, modified stoker, close-coupled gasification, and combined-cycle combustion turbine units, as well as biodiesel-fired steam electric generators.

(c) The “low-emission” criterion for post-1997 Units and retrofitted pre-1998 Units will consist of emission limits of relevant air pollutants for Units in three capacity ranges, instead of by the current case-by-case procedure. These criteria are presented below, including some background, two tables, and an explanation of how the DOER and DEP propose to develop and use final emission limits from these tables and from stakeholder comment on the tables.

The DEP has been assisting DOER in making “low emission” determinations under the existing RPS regulations. That effort, which involves reviewing proposals from both in-state and out-of-state facilities, has involved more resources than DEP anticipated, and a process that DOER and DEP believe can be streamlined. In addition, some project proponents have expressed concern about the level of certainty available to them with respect to the emission levels that will qualify a plant as a New Renewable Generation Unit under the RPS regulations.

To address these issues, DEP and DOER are proposing to issue specific emission standards that, if met, would qualify projects for RPS. This would increase the level of certainty and greatly streamline the process. As a starting point for discussion on the emission limits, this NOI includes Tables 2 and 3. Table 2 contains emission limits based on currently permitted wood fired boilers. DEP believes these limits are achievable using current technologies, and would apply to both new and retrofitted boilers. Table 3 contains limits that DEP believes are achievable through technology transfer from other combustion sources. These would be achieved in practice by, for example, equipping the boiler with selective catalytic reduction (SCR) and a carbon monoxide catalyst, with each achieving a level of control comparable to that achieved in other uses (e.g. coal fired boilers). These limits would be a reasonable starting point for a Best Available Control Technology (BACT) determination for new facilities.

DEP views the emission limits in Table 2 as the ceiling – the maximum (i.e., the least stringent) – that would be acceptable. DEP and DOER are seeking comment on where, between the emission limits in Table 2 and Table 3, a reasonable standard for future projects exists, recognizing that low emission technology is constantly improving. DEP and DOER are also seeking comment on a practical way of increasing the stringency of the standards over time. These comments will assist DEP in a separate rulemaking to establish emission standards for Massachusetts biomass facilities in its regulations. This would allow such facilities to obtain a permit without going through a separate BACT analysis. It would also constitute the standard required of out-of-state facilities to qualify as New Renewable Generation Units under the Massachusetts RPS.

Table 2
New or Retooled Biomass Steam Electric Generation Units
Permitted Emission Limitations³¹

Nameplate capacity	Equal to or greater than 25 MW	Equal to or greater than 10 MW and less than 25 MW	Equal to or greater than 1 MW and less than 10 MW
SO ₂	0.025 lbs/MMBtu	0.025 lbs/MMBtu	0.025 lbs/MMBtu
NO _x	0.075 lbs/MMBtu	0.075 lbs/MMBtu	0.093 lbs/MMBtu
Ammonia	13 PPM @ 3%O ₂	13 PPM @ 3%O ₂	25 PPM @ 3%O ₂
CO	0.1 lbs/MMBtu	0.17 lbs/MMBtu	0.25 lbs/MMBtu
PM ₁₀	0.011 lbs/MMBtu	0.015 lbs/MMBtu	0.015 lbs/MMBtu
VOC	0.01lbs/MMBtu	0.01lbs/MMBtu	0.01lbs/MMBtu
Toxics ³²	Based on modeling	Based on modeling	Based on modeling
Opacity	10%	10%	10%
Monitoring	CEMS – NO _x , opacity, NH ₃ , SO ₂ (C&D) Annual PM and metals ³³ testing	CEMS – NO _x , opacity, NH ₃ , SO ₂ (C&D) Annual PM and metals ³⁴ testing	PMS Annual PM and metals ³⁵ testing
Reporting	Quarterly, annually	Quarterly, annually	Quarterly, annually

³¹ The boilers used to develop these limits are: Schiller Station in Portsmouth, NH, Whitefield Power in Whitefield, NH, Boralex in Stratton, ME, Ware Cogen in Ware, MA, and McNeil Station in Burlington, VT.

³² Ambient modeling would be performed to demonstrate that the DEP's Acceptable Ambient Levels and Threshold Effects Levels would not be exceeded.

³³ Metals testing is required for facilities burning wood from construction and demolition debris, and possibly other biomass sources.

³⁴ See footnote 33.

³⁵ See footnote 33.

Table 3
New or Retooled Steam Electric Generation Units
Achievable Emission Limitations

Nameplate capacity	Equal to or greater than 25 MW	Equal to or greater than 10 MW and less than 25 MW	Equal to or greater than 1 MW and less than 10 MW
SO ₂	0.02 lbs/MMBtu	0.02 lbs/MMBtu	0.02 lbs/MMBtu
NO _x	0.015 lbs/MMBtu	0.015 lbs/MMBtu	0.1 lbs/MMBtu
Ammonia	2 PPM @ 3% O ₂	2 PPM @ 3 % O ₂	10 PPM @ 3% O ₂
CO	0.01 lbs/MMBtu	0.01 lbs/MMBtu	0.25 lbs/MMBtu
PM ₁₀	0.011 lbs/mmBtu	0.011 lbs/mmBtu	0.011 lbs/MMBtu
VOC	0.01 lbs/MMBtu	0.01 lbs/MMBtu	0.01lbs/MMBtu
Opacity	5%	5%	5%
HCl (biomass containing chlorinated compounds)	50 ppm @ 3% O ₂	50 ppm @ 3% O ₂	50 ppm @ 3% O ₂
arsenic, antimony, beryllium, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, and selenium (wood containing C&D wood)	85% removal of mercury and 99.9% removal of the other metals, and ambient modeling to demonstrate MA AALs/TELs are not exceeded.	85% removal of mercury and 99.9% removal of the other metals, and ambient modeling to demonstrate MA AALs/TELs are not exceeded.	85% removal of mercury and 99.9% removal of the other metals, and ambient modeling to demonstrate MA AALs/TELs are not exceeded.
Monitoring	CEMS – NO _x , opacity, NH ₃ , SO ₂ (C&D), Annual PM and metals ³⁶ testing	CEMS – NO _x , opacity, NH ₃ , SO ₂ (C&D) Annual PM and metals ³⁷ testing	PMS Annual PM and metals ³⁸ testing
Reporting	Quarterly, annually	Quarterly, annually	Quarterly, annually

³⁶ Metals testing is required for facilities burning wood from construction and demolition debris.

³⁷ See footnote 36.

³⁸ See footnote 36.

(d) If a new Generation Unit is of a size and type to which the DEP's forthcoming regulations for Engines and Small Turbines at 310 CMR 7.26(40-46) would apply if the unit were located in Massachusetts, the DOER would regard the unit as meeting both the advanced technology and low-emissions standards of RPS if it met the standards of those forthcoming DEP regulations. This is expected to apply to most biodiesel units, as well as to small biomass gasification/turbine units.

(e) Vintage Units (those biomass Units in operation prior to 1998 that meet the "advanced" technology Heat Rate standard of the previous sub-section) would be evaluated by the same emission criteria as under the current RPS regulations (at 225 CMR 14.05(1)(a)6.b). Existing Units that do not qualify as Vintage Units and that are retrofitted after 1997 to comply with the revised Heat Rate and Emissions benchmarks described in (b), above, would be treated as described in section 3 below.

(f) Any post-1997 Units that do not require air permits would be evaluated in two size categories in order to determine their eligibility with the low-emissions standard:

1. Units with nameplate capacities of one MW or larger would be covered with reference to the above provisions in (b) and (c) or in (d), namely either by the Net Heat Rate limits for "advanced" and the Emission limitations for "low emission," or by the DEP's emission standards for small engines and turbines.

2. Units with nameplate capacities less than one MW would be evaluated on a case-by-case basis that does not reference any specific regulatory criteria for "advanced" or "low-emissions" unless they are of a size and type to which the DEP's output-based standards for small engines and turbines would apply. The Guidelines would provide additional details intended to simplify this evaluation for at least some types of small Units.

(g) DOER, in consultation with the DEP, may periodically modify the RPS standards for Heat Rate and Emissions to keep pace with and encourage the development of more advanced and cleaner biomass technologies. Any such changes would be announced as revisions of DOER's RPS Guidelines at least two years prior to the date when the new standards would be enforced. The purpose of the two years is to provide sufficient lead-time for developers balanced against improvements in technology. It should be noted, that, with regard to any changes in emission limits, before such changes would apply to DEP permitting of Units located in Massachusetts, the DEP would require a public rulemaking to revise its regulations .

3. Retrofitting with Eligible Biomass Technologies Waiver.

(a) A new section in 14.05 would replace the current, April 2004 "Advanced Biomass Retooling Guideline Guidelines" with regulatory provisions. This section would explicitly, but conditionally, exempt from the Vintage Waiver requirements any plants that do not qualify as Vintage Units and that are retrofitted after 1997 to comply with the revised Heat Rate and Emissions benchmarks described above in 1(b) and 1(c) or in 1(d) or in 1(f).

(b) However, this section also would limit the period in which the output of such a plant would be regarded as New Renewable Generation to 36 calendar months, that is,

through the end of the 36th complete calendar month after commencing operation consistent with the conditions of its Statement of Qualification. DOER intends this provision to provide sufficient, but not excessive, financial incentive for retooling older plants (some of which are threatened with closure when their PURPA contracts expire), thereby extending their useful lives, but conditioned on their retrofit with advanced technologies that provide the energy efficiency and air emission benefits of new plants. The proposed limit on their period of RPS qualification is meant to mitigate what may be an unfair competitive advantage over both new biomass plants and new plants that utilize other renewable resources and technologies. This limited incentive for biomass plant retrofits may facilitate an immediate, short-term amelioration of the current condition of inadequate New Renewable Generation capacity while not handicapping the desired acceleration of new plant construction.

4. Time Limits on Project Start-Up after Statement of Qualification or Advisory Ruling

(a) Any Generation Unit that receives a Statement of Qualification would have a time limit for completion of construction and commencement of electricity generation, failing which, its qualification would expire. The time limit will be the same as the limit provided in the Pre-Construction Permit (or its equivalent) from the environmental agency of the jurisdiction in which the plant is to be located. If the Unit is outside of the ISO New England Control Area, then that limit also would apply to meeting the Import Provisions at 225 CMR 14.05(5). A petition for extension would be subject to whatever qualification criteria were in effect at the time of such petition, which, in the case of biomass plants, could be more stringent than the criteria in effect at the time of the original Statement of Qualification. However, in the case of a Generation Unit that is already RPS-qualified but has not yet commenced operation under the conditions of its Statement of Qualification (or, for a unit outside of ISO-NE, has not yet met the Import Provisions) by the effective date of this expected regulatory revision, six months would be allowed from that effective date, failing which, its qualification would expire. Again, a petition for more time could be considered on a case-by-case basis, subject to any changes in the qualification criteria, as noted above.

(b) Any proposed Generation Unit (whether for a new or a retrofitted facility) that receives a positive Advisory Ruling would have a twelve month limit for submitting a completed Statement of Qualification Application, failing which its Advisory Ruling would expire. However, in the case of a Generation Unit that already has an Advisory Ruling but that has not yet submitted a Statement of Qualification Application by the effective date of this expected regulatory revision, such Application would have to be submitted no later than nine months after that effective date. In either case of failing to meet the deadline, a petition for extension would be subject to any changes in qualification criteria that might have occurred since the original Advisory Ruling, which, in the case of biomass plants, could be more stringent than the criteria in effect at the time of the original Advisory Ruling.

5. Special Provision for Any Fuel Fabricated from Both RPS-Eligible and Ineligible Feedstocks

In the case of a composite fuel that is fabricated or blended from any feedstocks that qualify as Eligible Renewable Fuels, as well as feedstocks that do not qualify, DOER would use an approach comparable to the current Co-Firing with Ineligible Fuels Waiver at 225 CMR 14.05(3). This would apply to such fuels as biodiesel blends and fuel cubes/pellets containing plastic-coated paper or containing sawdust and some ineligible materials (especially petrochemicals). The eligible fraction of the fuel would be calculated in accordance to relative heat values of the constituent feedstocks. Those heat values would have to be calculated and documented in a manner satisfactory to DOER, and the relative quantities of feed stock entering the manufacture of the fuel likewise would have to be documented and certified. If the eligible feedstock of such a composite fuel is biomass, then a Generation Unit utilizing such fuels would have to meet the requirements of a low-emission, advanced biomass power conversion technology.

Questions

DOER and DEP invite comments on the Issues identified in this Notice, including the Proposed Revisions to the RPS Regulations. Comments on the Issues or the Proposed Revisions should identify the section (and subsection) of the Summary of Proposed Revisions part of this Notice.

In addition, responses to the following questions about the Proposed Revisions would substantially assist DOER and DEP in making a well-informed decision about the language of the revised regulations that will be issued in a formal rulemaking following this Inquiry. Respondents should clearly identify by number the question(s) to which they are responding. Finally, citation to sections of the current RPS regulations, whenever appropriate, would be helpful.

- A. What specific improvements made to biomass stoker combustion technology have occurred over the past 20 years? Would any of these, individually or collectively, justify DOER's regarding a newly installed, stoker combustion biomass plant as using "advanced biomass power conversion technology"?
- B. Is Net Heat Rate, as defined in Section 2(b) of the Proposed Revisions, a reasonable basis for determination of "advanced biomass power conversion technologies"? What protocols should DOER require of biomass plant developers to appropriately ascertain their Net Heat Rates (considering fuel variability, system capacity factors, operational characteristics, etc.)? Can the same protocol work for both new and retrofitted biomass plants? Are the Net Heat Rates provided in Table 1 illustrative of advanced, highly efficient technologies that now or soon will be commercially available? Do you recommend a better alternative to setting Net Heat Rates according to plant size or type? If Net Heat Rate is *not* a reasonable determination of Advanced Technology, identify and describe in detail what standards/criteria you think would better accomplish the identification of "advanced biomass power conversion technologies." Any information that you can provide regarding the net heat rates of actual plants in operation today, as well as the costs of the various types of plants (both new and retooled), would be extremely useful.

- C. Do the emission rates and monitoring requirements specified in Tables 2 and 3 appropriately capture the “low-emissions” criteria that are achievable by “advanced biomass energy conversion technologies”? What are the appropriate averaging times for the limits? Should special consideration be given to retooled biomass plants? Should limits be set according to boiler size? Are the proposed size ranges appropriate? If not, please provide and explain alternative.
- D. Would output-based emission rates reflect the environmental impact of biomass generation units better than the proposed input-based rates? If so, what limits would be appropriate? Alternately, what method for determining such limits would be appropriate and reliable?
- E. Is the proposal to increase the stringency of the Heat Rate and emission standards over time (at Section 2(g) of the Proposed Revisions) through RPS Guidelines, in conjunction with the formal revision of DEP air quality regulations and with two-year lead-time reasonable? Do you have any procedural refinements to suggest?
- F. Do you think that the competing market issues and policy objectives related to retrofitting existing biomass units (as discussed at Section 3(b) of the Proposed Revisions and in the Issues sections) are adequately and reasonably addressed by a proposed time limitation of RPS eligibility for RECs? Do you think that the three-year limit for receiving RECs is appropriate? Support your critique with specific data on the costs (capital and operating) and payback periods, rates of return, or net present value typical for specific types of retooling.
- G. Do you concur with DOER’s proposal (at Section 4 of the Proposed Revisions) to place time limits on the completion of projects that have received Statements of Qualification? On the submittal of Statement of Qualification Applications for proposed projects that have received Advisory Rulings? Are the proposed time limits appropriate, or would other limits be more fair?
- H. Is DOER’s proposed method (at Section 5 of the Proposed Revisions) for dealing with composite fuels, fabricated or blended from both eligible and ineligible feedstocks, fair and appropriate? Do you recommend any modifications?

Procedure and Schedule

DOER and DEP intend, through this Notice of Inquiry, to engage with stakeholders on the issues and questions in this Notice during an intensive, four-week process. DOER and DEP reserve the right to extend the timeframe and would announce any such extension to all participants. DOER and DEP also may issue questions in addition to the ones in this Notice.

An announcement of this Notice, as well as any subsequent general notices will be distributed by the following methods:

- Posting at the DOER RPS homepage (www.mass.gov/doer/rps) and at the homepage of the New England Power Pool’s Generation Information System (www.nepoolgis.com).
- E-mail messages to relevant lists at DOER (including the Biomass Energy Working Group list, the RPS Stakeholder list, contacts for the qualified new renewable generation units, 2003 retail electricity suppliers, Advisory Ruling requesters, and

those who have requested copies of the Notice). Interested persons will be added to any of these lists, as appropriate, upon request (see contact information below).

- Mail or hand-delivery to members of the Joint Committee on Telecommunications, Utilities and Energy.

The following is the schedule of deadlines and events in this Inquiry:

Table 4
Inquiry Timetable

Friday, July 1	Issuance of Notice
Tuesday , July 19	Initial Comments due
Tuesday , July 19	Reservations due for speaking at Stakeholder Conference
July 7 – August 1	On-line posting of Initial Comments and other feedback
Thursday, July 28	Stakeholder Conference
Thursday, August 4	Final Comments due

The time and location of the Stakeholder Conference will be communicated in the same manner as other general notices (see above). At the Stakeholder Conference, Public officials and those with reservations will speak first, followed by statements by others and then a moderated discussion among all attendees.

Although DOER and DEP may consider what is learned in phone calls and meetings, written comments, especially in electronic form – as e-mail messages or as Word™ documents attached to e-mail messages – are highly preferred in order to facilitate on-line posting. *DOER will post pertinent, non-confidential e-mail messages, letters, and other documents as PDF files at a new section of the DOER website, and will welcome early feedback on such documents.* Stakeholders are invited and urged to provide early responses to the posted comments of others, and feedback on previously posted comments will likewise be posted. To facilitate such public discourse, receipt of written comments well in advance of both scheduled comment deadlines would be appreciated, since it would allow for earlier feedback. In order to maximize the free exchange of information and views, submission of “initial comments” will not be a prerequisite to the submission of “final comments.”

A respondent who has commercially sensitive information that is not publicly available elsewhere and that would be useful for answering any of these questions may request and receive confidential treatment for that information to the extent provided in the law.

All comments and communications relative to this Inquiry should be directed to:

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After the close of the Inquiry period, and after DOER and DEP have given expeditious but careful consideration to the information and opinions received, DOER and DEP will publish a Policy Statement informing the public of the results of the review and a decision to move forward with specific regulatory revisions through a formal Rulemaking, as governed under the laws of the Commonwealth, in which at least one Public Hearing is held and written comments are received. The Rulemaking will commence as soon as possible after the Inquiry ends.

DOER and DEP greatly appreciate the interest and participation of the many stakeholders in this Inquiry.